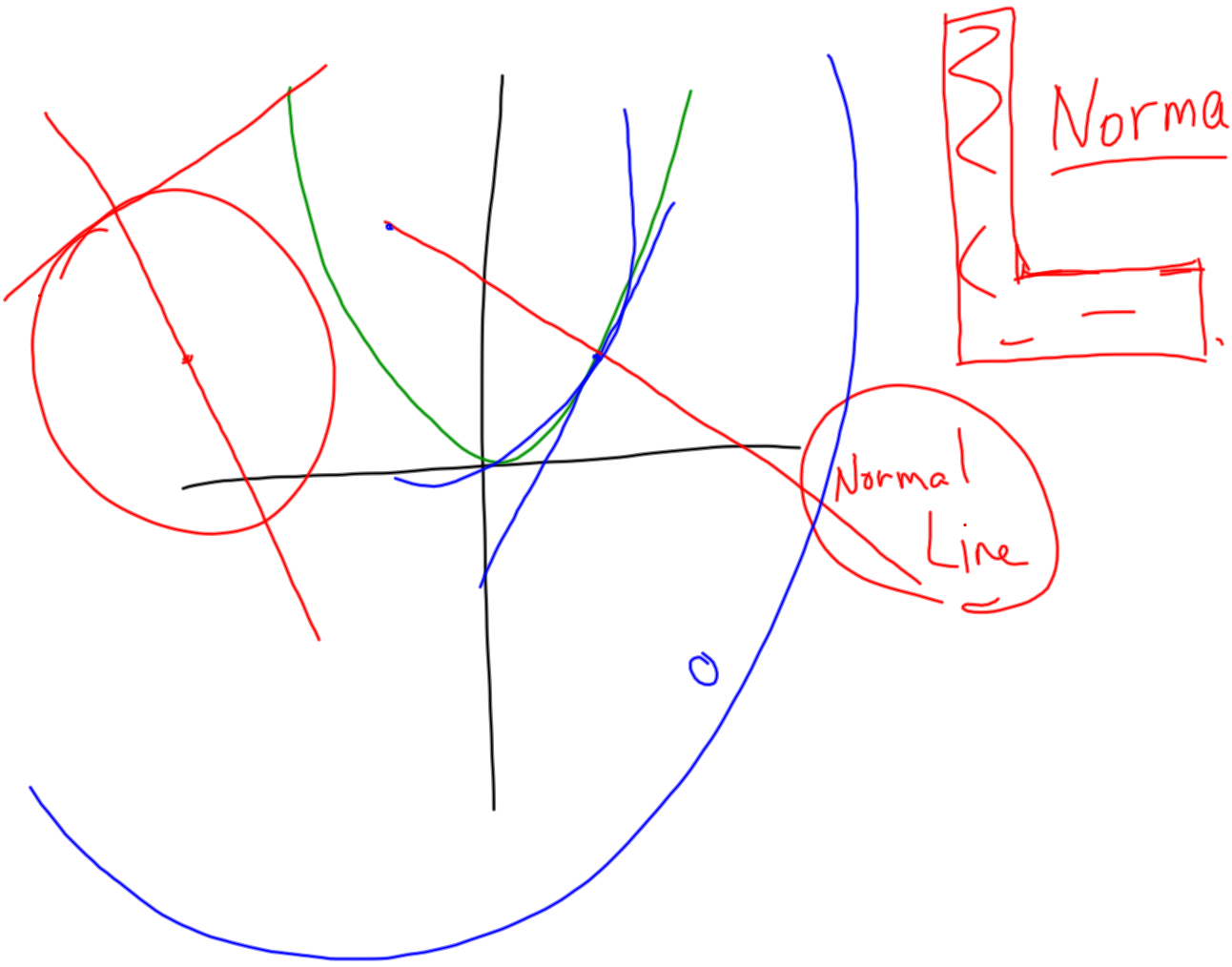

Norma
Normal
Line
O

5.2/11

$$f(x) = x^{\frac{1}{3}}(x+4)$$

$$f'(x) = \frac{1}{3}x^{-\frac{2}{3}}(x+4) + x^{1/3}(1)$$

$x^{-2/3}$

now set $f'(x) = 0$

$$f'(x) = x^{-\frac{2}{3}}\left[\frac{1}{3}(x+4) + x^1\right]$$

$$= x^{-2/3}\left[\frac{4}{3}x + \frac{4}{3}\right] = \frac{4}{3x^{2/3}}(x+1)$$

$f' = 0$ when $x+1=0$ $\boxed{x=-1}$

f' undefined when $x^{2/3} = 0$

$\boxed{x=0}$

0 of first derivative

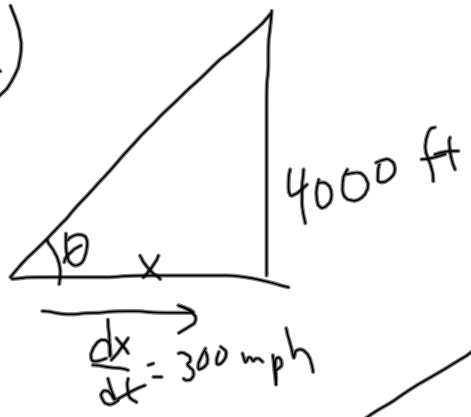
f(x) | -

$f''(3) = -$ number

|

∴ at a Critical # the sign of the second derivative Will be opposite the concavity

24a)



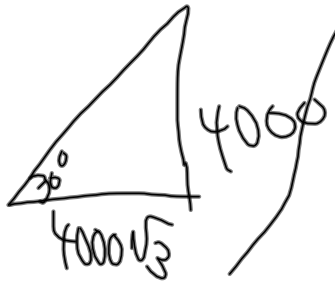
$$\tan\theta = \frac{4000'}{x}$$

$$\sec^2\theta \frac{d\theta}{dt} = -\frac{4000}{x^2}\frac{dx}{dt}$$

$$\frac{4}{3}\frac{d\theta}{dt} = -\frac{4000}{x^2}\frac{dx}{dt}$$

$$\sec^2 30° = \frac{1}{\cos^2 30°} = \frac{1}{\left(\frac{\sqrt{3}}{2}\right)^2} = \frac{4}{3}$$

$$\frac{d\theta}{dt} = \left(\frac{3}{4}\right)\left(-\frac{4000}{4000^2(\sqrt{3})^2}\right)\frac{300\text{mi}}{\text{hr}}$$



$$\frac{d\theta}{dt} = \left(\frac{3}{4}\right)\left(\frac{-1}{(4000)(3)}\right)\left(\frac{75}{300\text{mi}}\frac{300\text{mi}}{\text{hr}}\right)\left(\frac{1\text{hr}}{3600\text{sec}}\right)\frac{5280\text{ft}}{\text{mi}}\left(\frac{180}{\pi}\right)$$

$$\frac{d\theta}{dt} = \frac{-75\cdot 5280}{4000\cdot 3600}\left(\frac{180}{\pi}\right)$$

$$= -\frac{33}{(48)(25)}\frac{180}{\pi} = \frac{-11}{1625}\cdot\frac{180}{\pi}$$

$$= \frac{-11}{400}\cdot\frac{180}{\pi} = \frac{(-11)(9)}{20\pi}$$